



DEVELOPING GLOBAL ACTION NETWORKS AS COMMUNITIES OF PRACTICE:

*AN INITIAL INVESTIGATION WITH THE
COOPERATIVE PROGRAMME ON WATER AND CLIMATE*

January 7, 2005

By: William M. Snyder – [GAN-Net](#)

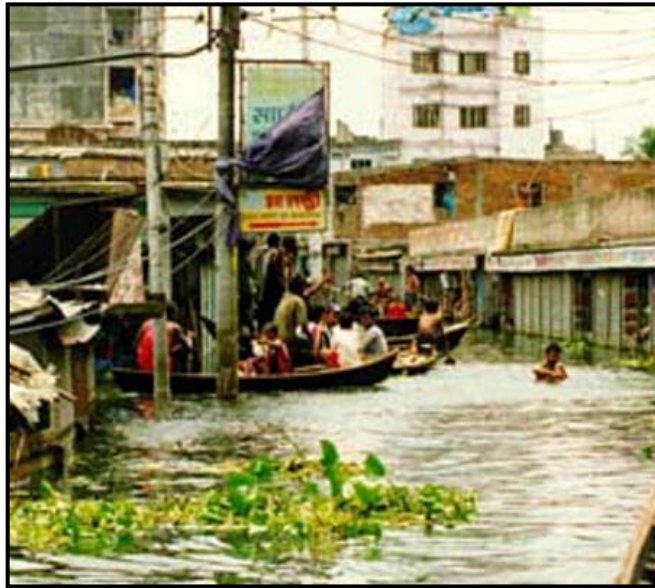
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Developing Global Action Networks as Communities of Practice: *An Initial Investigation with the Cooperative Programme on Water and Climate*

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Executive Summary

The purpose of the Water and Climate Community of Practice initiative was to cultivate a global learning network to help local, national, basin, and regional multi-stakeholder partnerships address water-and-climate (W&C) challenges. Sponsors and support team members (including the author) organized a pilot initiative that included three W&C partnerships: Central America (Small Valleys), Bangladesh, and West Africa. Leaders from these W&C partnerships had participated in earlier activities (in 2001-2003) that were sponsored by the Dialogue on Water and Climate (DWC). They had demonstrated leadership in the development of their local W&C partnerships, and one of their partnership objectives was to share their experiences with others.

One goal of the Water and Climate Community initiative was to build the foundation for a sustainable learning network on the topic of partnership development. Another goal was to document the tools, methods, and key roles to guide future partnership initiatives.

An important insight early in project was that the diversity of the three selected partnerships created a dilemma: on the one hand, it was useful to compare different types of partnerships; on the other hand, such diversity made it more difficult to match practitioner interests and identify common problems to work on together.

¹ Steve Waddell, Executive Director of GAN-Net, wrote the initial outline for this report and provided valuable commentary throughout its development.

In the end, the pilot did not meet the goal of launching a sustainable global community of practice for building and sharing knowledge among partnership leaders. We did, however, identify a number of critical success factors as well as pitfalls. We also developed several new tools and frameworks for increasing W&C capacity through partnership development; chief among these is a “learning system” framework for promoting innovation and collaboration to achieve public good objectives.

Community-of-practice success factors included:

- *Build a shared understanding and commitment* among sponsors and participants regarding the focal issues and expected results
- *Provide global coordination* to support regional coordinators, organize action-learning activities, and provide overall guidance for the initiative
- *Recruit local initiative leaders* with the time and expertise required to coordinate learning activities and related change efforts at the regional level
- *Respond to community development needs* with appropriate interventions to address typical tensions that occur along the way
- *Design and implement technologies* to support virtual collaboration—including on-line workshops, peer consulting, and joint project activities

The W&C Community of Practice case also points to an emerging shift in the role of global network leadership. Central office leaders and secretariats are in the midst of a transition from a traditional corporate headquarters role towards a “community coordinator” role; from a center-to-periphery structure to a saturated-network model;

- *from* an administrative center that determines priorities for local projects and funding initiatives; and acts as a privileged distribution channel for information-dissemination and technical assistance
- *towards* a coordinator of a global peer-to-peer learning network in which regional participants, in turn, cultivate their own local learning networks (hence, a multi-level network of networks); in this model, the global center and local nodes collaborate as equal partners to build the capacity of the whole global-local learning system.

Background

The Dialogue on Water and Climate began an initiative in 2001 to help 18 multi-stakeholder groups at local, national, basin, and regional levels to address issues related to water and climate variability. In December 2003, they held a conference in the Dutch university town of Wageningen to consolidate insights from these 18 initiatives and develop action plans for next steps. Another conference objective was to launch a community of practice that would include 3 typical types of partnerships. The community’s purpose was to build knowledge and skills related to multi-stakeholder partnerships and make these available to W&C partnerships worldwide.

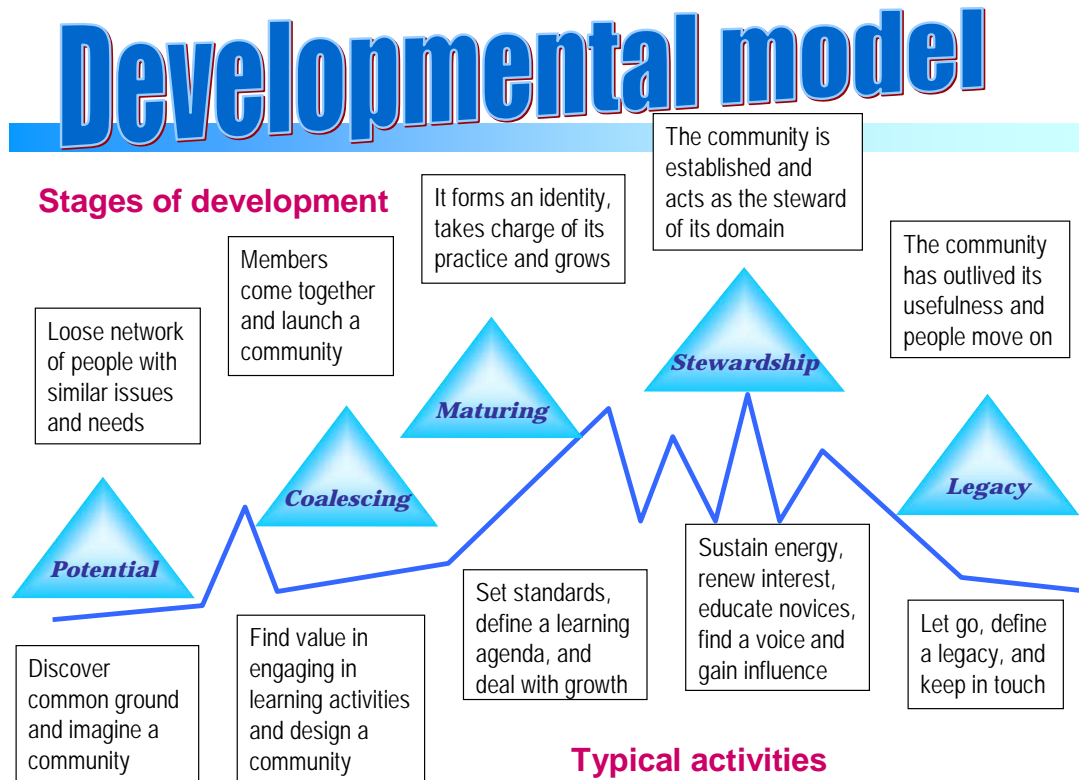
At the forum, a proposal was made to organize a peer-to-peer learning network—called a “community of practice.” The term refers to a knowledge-based structure that has gained increasing attention as organizations worldwide—in all sectors—race to keep pace with scientific and technical discoveries. Communities of practice are defined as “groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (Wenger, et al., 2002).

The Water and Climate Community was initiated as a project of the Global Action Network (GAN-Net). Henk van Schaik of CPWC was the overall project sponsor. He provided strategic guidance and helped to recruit and engage the participation of regional participants. A support team that included Steve Waddell and Bill Snyder in the United States and George de Gooijer in the Netherlands coordinated activities at the global level while also providing coaching and progress reports to sponsors. Ralph Taylor of Metanoia sponsored the support team activity and helped to oversee the community's progress towards its strategic goals.

The W&C Community consisted of partnership leaders from three continents—a national partnership led by IUCN in Bangladesh, a consortium of community level partnerships led by IUCN from Central America, and a regional partnership led by GWP and IUCN in West Africa. A sub-set of participants knew each other from two earlier information dissemination meetings in the Netherlands; several had never met in person. The goal was to cultivate a community of practice to share knowledge, collaborate on projects, and build a growing network of practitioners worldwide. In retrospect, given the initial conditions, the community-building goal was unrealistic. In any case, the community did not achieve that objective. Players gathered several times via teleconferences after the “launch” meeting and worked separately on regional case studies, but they did not gain a sustained capacity for peer-to-peer learning.

W&C Community Development Story

Communities of practice—whether ad hoc or strategic—typically evolve through a series of developmental stages: potential, coalescing, maturing, stewardship, and legacy. (See Figure 1.) One way to interpret the story of the W&C Community is to analyze its development according to criteria associated with these stages.



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Figure 1 – Community of Practice Developmental Model.

Even before launching a community—or a constellation of communities (as is often the case in large organizations and civic contexts)—a number of social and technical issues should be considered. Communities of practice operate in the context of a broader learning system, which includes various stakeholders and institutions, other communities, and an organizational infrastructure. A key dimension of the learning system includes roles that provide for governance, support, and coordinating functions. These functions are crucial for community development.

Key roles in the Water and Climate Variability Community

Key roles for leading a strategic community-of-practice initiative include a sponsor board, support team, and community coordinators. These players support central community development tasks: identifying domain issues; coalescing the community; and organizing practice-development activities and joint initiatives. (See Figure 2.)

Sponsors were actively engaged in community activities; functions included:

- Developing strategic goals for the community
- Providing funding for the support team and regional coordinators
- Participating in ongoing reviews to assess progress and foster development
- Linking the initiative to related initiatives, organizations, and events

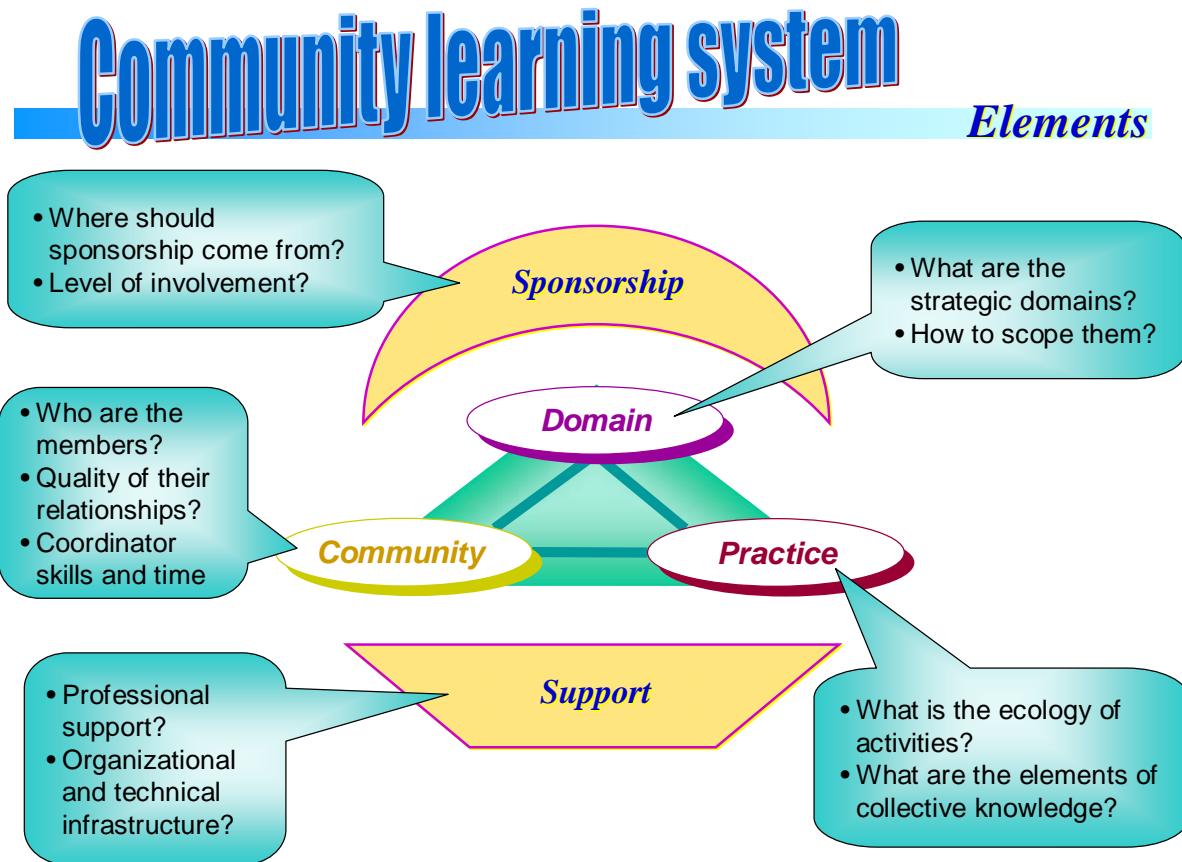


Figure 2 – Community of Practice Learning Systems Elements.

Support team activities included:

- Coaching regional coordinators
- Guiding case development
- Coordinating the global community
- Liaising with sponsors
- Developing the technology platform—including teleconference events and the website (for storing documents, posting messages, member directory, etc.)
- Documenting the methods, results, lessons learned, and proposals for next steps

Local coordinators (aka “stewards”) led activities at the regional level. Their roles included:

- Identifying local players to participate in a regional learning system initiative
- Developing regional case studies—as a baseline for identifying local improvement opportunities and for sharing insights and innovations across regions
- Coordinating peer-to-peer and cross-level learning at the regional level
- Liaising with local institutions: government agencies, NGO’s, funders, and others

Analysis of the W&C Community in developmental terms

Potential

In the potential phase, a “discovery” process identifies practitioners with similar problems and interests who want to learn and work together with peers. The W&C Community discovery was conducted mostly during the 2003 “wrap-up” conference in Wageningen. Before the conference, the sponsor selected 3 regional groups to participate in a follow-up initiative to cultivate a community of practice. (This selection process differed from an earlier plan to send an invitation to all 18 projects and have them “bid” for the opportunity to participate.) The 3 participating regions—Bangladesh, Central America and West Africa—were chosen because each had unique characteristics. The rationale was that if we could find the common elements among them we would surface a robust community-of-practice framework that would apply to regions worldwide.

During the conference, a support team member conducted separate two-hour workshops with each region to introduce the community of practice framework. Participants reflected on issues related to the three main structural elements of a community of practice: *domain* (what it is about), *community* (who is engaged) and *practice* (what participants know, and how they learn and work together). (See Figure 2.) These individual workshops prepared participants for collective meetings later in the conference which included practitioners from all three regions. During these meetings, they discussed opportunities to build capacity together by sharing their experiences addressing W&C Community challenges.

The workshops in Wageningen served as both a community discovery process and launch event. Normally, a preliminary understanding of the key domain issues is identified through pre-launch conversations with potential community members and stakeholders; the community launch marks the passage from the potential stage to “coalescing.” By conducting discovery activities earlier, the launch can focus on prioritizing issues, building relationships, and deciding how to work together.

A typical community launch addresses six key issues:

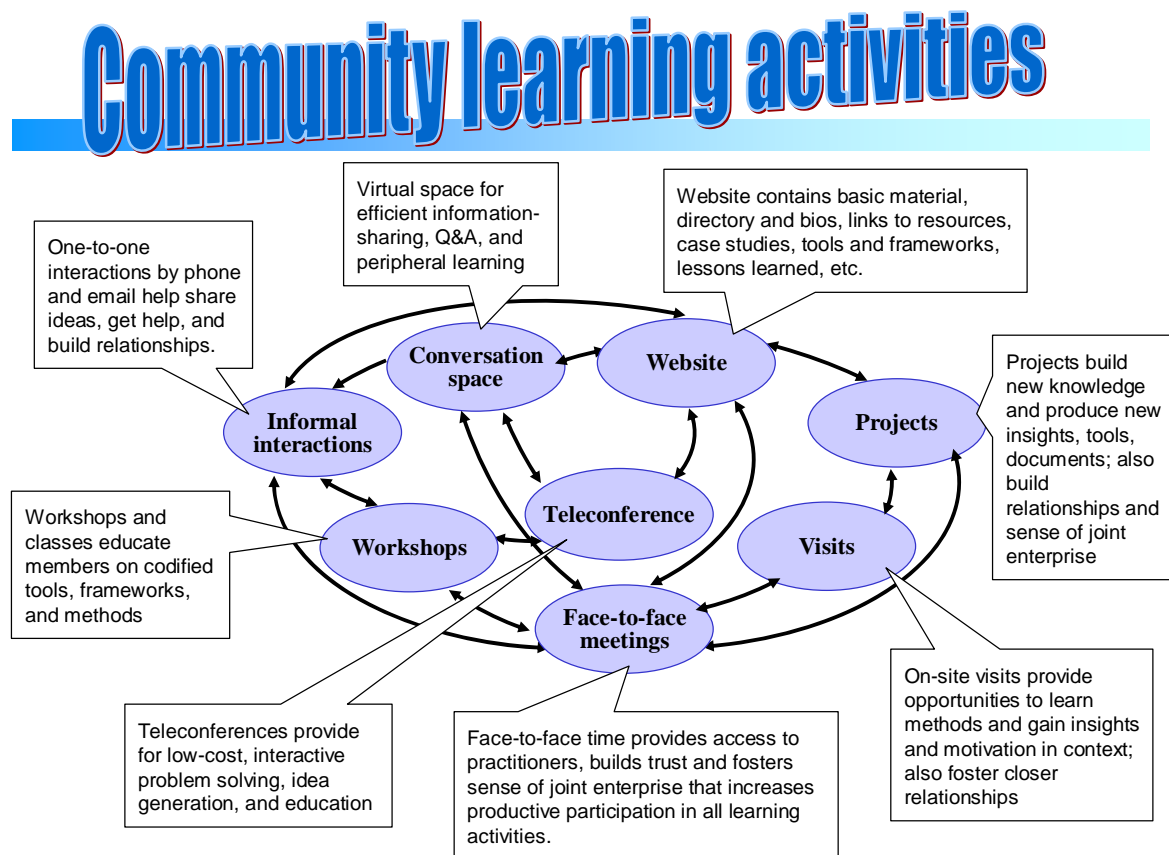
1. What is the domain of issues that matter to participants—its “action-learning agenda”?
2. Who should be involved, in what roles, and according to what norms of participation?
3. What are the “practice-development” activities to foster peer-to-peer learning and improve results—for example, “case clinic” teleconferences, capturing knowledge in an online repository, and projects to develop tools or collaborate on an initiative?
4. What sponsorship is needed and how to manage the sponsor-community relationship?
5. What coaching, logistical support, measurement, and results reports are required?
6. What types of collaborative technology and associated skills and behavioral norms (for example, responding to listserv questions or contributing to the website) will foster communication, knowledge access, and group coordination?

In part because so little discovery had been conducted earlier, these issues were insufficiently addressed at the Wageningen launch. In addition, due to other conference commitments, participants had limited time to focus on community issues. In fact, the community’s learning agenda only became clear months later, after the support team had conducted interviews with regional participants—in what was essentially a remedial discovery process. It was then that participants realized that talking about specific coping methods (such as early warning systems) would not be very useful because local conditions and priorities were so different. Instead, they concluded that the community’s focus should be on ways to cultivate a regional W&C community-based “learning system.”

The launch did not meet several basic objectives. It did not sufficiently address expectations about participation (how much, how frequently, roles to play, etc.). Members understood that they would be connecting virtually over the phone and internet—but the group did not design specific activities for learning together; nor did they plan adequately for implementing collaboration technologies (teleconferences, website, listserv, etc.). Further, the roles and expectations of sponsors, the support team, and regional coordinators were not well defined. Finally, the selection of participating regions should have been done as part of a pre-launch discovery process, during which both priority issues and compatible participants were identified. In short, more time and preparation were needed to plan and conduct the launch event.

Coalescing to form an ecology of interactions

Community “coalescing” begins during the launch process and takes root as participants get to know each other and begin to learn and work together. The coalescing process takes place in the context of an ecology of community activities. These activities differ along several dimensions—face-to-face and virtual; formal and informal; public and private. Community learning activities operate according to various rhythms—listserv announcements may come weekly; teleconferences monthly or bi-monthly; projects and visits generally occur when opportunities arise; back-channel e-mails and phone calls are ongoing; and the whole group may gather once or twice a year face-to-face. (See Figure 3.) Beyond their instrumental purpose to create and share knowledge, these activities increase the community’s “presence” in members’ lives and reinforce the sense of belonging and identity that are the foundation for collective learning and collaboration.



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Figure 3 – Community of Practice Ecology of Learning Activities.

The W&C Community engaged primarily in five interrelated action-learning activities:

- *Case studies* were developed to provide a foundation for case-clinic presentations across regions. We developed a template, interviewed players to get a first draft, and went through various revisions. (See Figure 4 for a summary of case template questions.)
- *An online resource base* was created to capture knowledge related to W&C regional learning systems.
 - Functions included a knowledge repository of cases, tools, frameworks, and articles; a directory of members; a listserv/message board; and a community overview. (See Figure 5.)
 - The online knowledge repository was used to store the regional case studies so they were accessible to all members across the three regions. The listserv and message board were used to communicate with the group and document our communication.

Learning System Case Template Questions

For each municipality

What are the capabilities? Who is engaged? What are the collaboration activities? What are the results?

Across municipalities

What are variations in capabilities, engagement, and activities? What are opportunities for collective action—learning, resources, and advocacy?

Socio-techno-science (expertise)

What are the capabilities? Who is engaged? What are collaboration activities?

Policy makers

How effective are current policies (regulations, funding, etc.)? Who is engaged? What are the collaboration activities?

Funders

What are the effective funding strategies? Short-term? Long-term?

Whole system (regional), across levels

Are there forums for learning and connecting? What is the level of sponsorship and support?

Global

How is this regional initiative connected to analogous learning-system efforts worldwide? By relationships with international NGOs, multi-nationals, and other global institutions? By types of players: socio-techno-scientists, policy makers, local practitioners, funders?

Figure 4 – Learning System Case Template Questions.

- *Teleconference case clinics* were conducted to share insights and methods across sites about learning system development.
 - These required significant support to frame the regional cases, organize presentations, facilitate discussion, and coordinate follow-up activities; presentations included the case description, key issues, and practical questions to address.
- *Coaching*
 - Support team members helped regional stewards choose a case that would address practical issues at the local level. The goal was not merely to document the current state of the regional learning system, but also to spur action on opportunities—such as improving collaboration between scientists and local farmers to prevent losses from unexpected floods.
- *Workshops* provide a forum for understanding concepts and frameworks and for building skills and shared expectations. The launch workshop in Wageningen also served to assimilate participants into the initiative, (although perhaps not the right mix of participants; and as mentioned above, without sufficient time or attention to establish a robust community foundation).

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Water & Climate Community of Practice

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	Name	Size	Creator	Created	Edit	Delete	Cut
	1. Bangladesh Reports, articles, case studies, proposals, etc		wsnyder40	03/10/2004	Edit	Delete	Cut
	2. Central America Reports, articles, case studies, proposals, etc.		wsnyder40	03/10/2004	Edit	Delete	Cut
	3. West Africa Reports, articles, case studies, proposals, etc		wsnyder40	03/10/2004	Edit	Delete	Cut
	4. W&CV Global Community Reports, meeting notes, member directory, articles, case studies, proposals, etc		wsnyder40	03/10/2004	Edit	Delete	Cut
	5. Generic community of practice material articles, cases, presentations, bibliography, etc.		wsnyder40	03/10/2004	Edit	Delete	Cut
	6. W&C Community admin stuff Tele-meeting etiquette, Member Directory Template, etc.		wsnyder40	04/04/2004	Edit	Delete	Cut

Figure 5 – Online Resource Base.

Beyond discovery and coalescing, there are three additional developmental stages: maturing, stewardship, and legacy. Although this community did not achieve maturity or stewardship, we can speculate about how the community might have looked during these stages.

- **Maturing** includes conducting projects to build the knowledge base and member skills. The drafts of regional case studies were a step in this direction. Members might have gone further and consulted with each other and outside experts about issues raised in the cases—such as how to link techno-scientists more effectively with villagers or how to organize large-scale, multi-stakeholder gatherings. Maturing also means growing membership in the community to include other regions and recruiting added support from global partners and funders.
- **Stewardship** is demonstrated when a community is known as a preeminent source of knowledge and professional expertise in its domain—in this case, learning system development for addressing W&C problems. A global stewardship community would include practitioners from leading W&C regions and influential NGOs, government agencies, funders, and multi-nationals. It would convene conferences, diffuse effective tools and methods, promulgate research, and provide an online knowledge repository. It would be a powerful advocate for W&C policies.
- **Legacy** becomes the community's prospect as its influence wanes or as more urgent issues emerge. The community may decide to redefine its focus, sub-divide, or become mainstreamed by incorporating itself within established or emerging global institutions. Or it may simply celebrate its achievements and disperse.

Case Findings: Regional Learning Systems

One of the most valuable outputs of the W&C Community initiative was the development of a “learning system” framework. It guided the development of case studies and highlighted promising opportunities for building W&C partnerships that operate at local, national, basin, regional, and global levels. The framework provides a map of various players in the system and raises a number of questions to assess their collective capacity to learn, innovate, and implement W&C policies and initiatives. (See Figure 6.)

Learning System Framework

The Learning System Framework identifies 4 general types of stakeholder communities relevant to all of CPWC’s 18 partner sites:

- local communities
- policy makers
- socio-techno-science experts
- funders

Each set of players constitutes its own community of practice—although these may be highly diffuse or even dysfunctional. Each group has a distinct culture and role to play. The challenge is to create strong communities of practice both *within* stakeholder groups and *across* them.

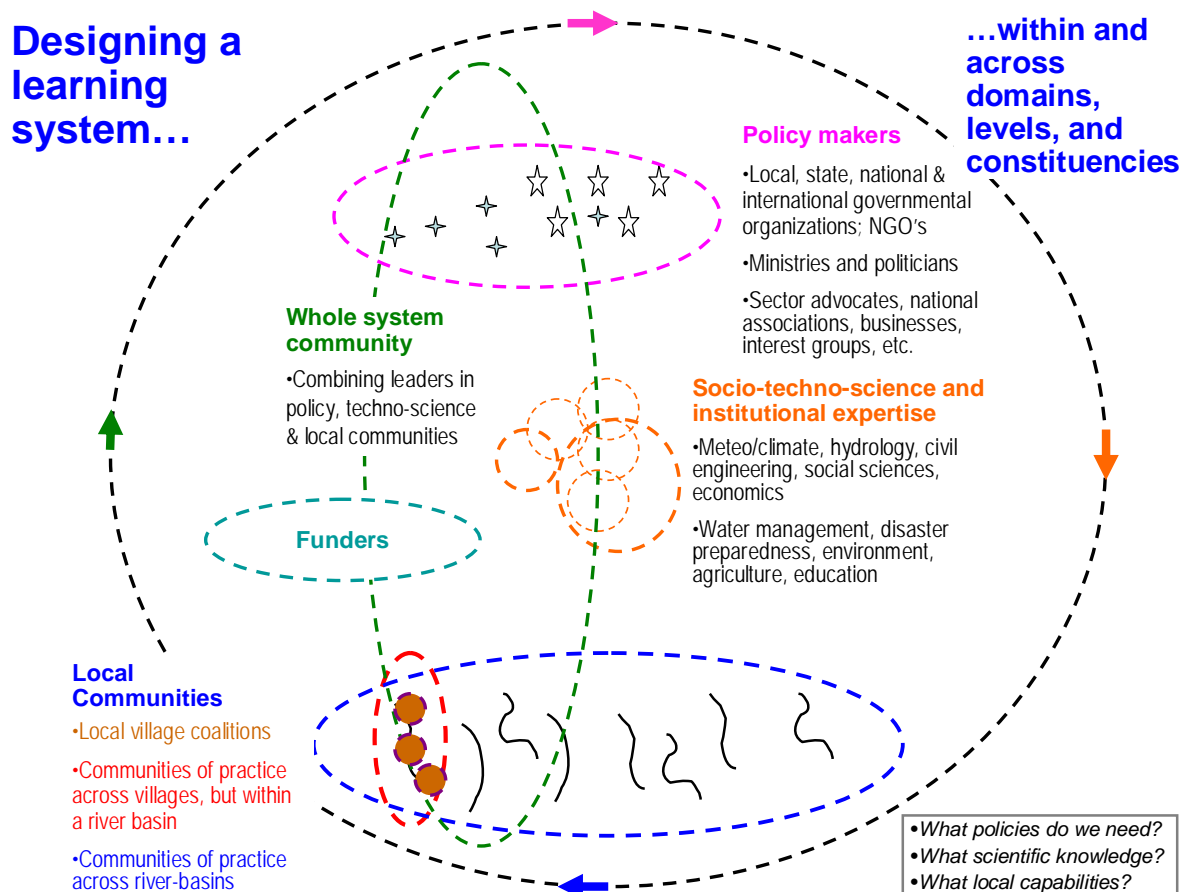


Figure 6 – Learning System Framework.

The W&C learning system includes a constellation of communities. The level of connectedness within and across them (as a “whole system” community) will determine a region’s capacity to control the financial and human costs of water and climate variability. The initial data from the W&C regional cases suggest that the linkages between village practitioners and the other stakeholder communities (policy, science, and funding) are particularly problematic.

Analysis questions (as seen in the case-development protocol described in Figure 4) address local priorities, levels of connectedness within and across communities, and overall themes (such as allocating funds and implementing policies).

Specific findings about regional learning systems

The sponsor invited the leaders of the W&C Dialogues from Bangladesh, Central America, and West Africa to develop cases using a structured format. The support team conducted preliminary analyses of two of the sites using the learning system framework. The analysis identified a number of opportunities for regions to learn from each other about ways to strengthen their local learning systems. Key issues included: improving learning and coordination among diverse players, building capacity at the village level, applying social science insights, and measuring results. The following points are excerpted from the draft case study of the Central American Small Valley Program (see Appendix). They illustrate development tasks and potential benefits of a healthy regional learning system:

- Develop ways to foster collective learning among key players, horizontally and vertically—including policy makers, techno-scientists, town leaders, farmers (and other local practitioners), donors, national and international NGO’s
 - The Small Valley Program (SVP) was not originally designed to be a peer-to-peer network. This raised a question regarding the level of support at policy and techno-science levels for peer-to-peer networks among local sites—or for that matter, about any collaborative dialogue, whether horizontal among peers or vertical among various learning-system stakeholders
- Institutionalize the capacity for learning and innovation in local towns to build W&C capability
 - A key factor that explained success for villages in the Central America site was the requirement that each municipality establish a “Local Emergency Center.” These were staffed by local practitioners—or by engineers from the university who lived in the village
- Improve coordination activities for collecting and disseminating information so it can be understood and applied effectively—both horizontally across villages in river valleys and vertically from policy makers and techno-scientists in the capital to these widely dispersed rural villages
 - The problematic relationship between techno-scientists and local players was partly to blame for information gaps; for example, capital city experts discounted the “rustic” (but from a local perspective: manageable, effective, and affordable!) early warning systems implemented in Honduran Small Valley villages
- Involve social science as well as physical science experts; the social issues—such as local resistance to “outsider” experts—were significant and their influence was vastly underestimated

- Identify results indicators and find ways to measure and report them
- Build stronger relationships and increase coordination among NGOs who provide support for prevention, preparation, and response
- Share transferable policies, scientific findings, engineering methods, and local skills with other regions, such as ways to reinforce residence structures, food storage methods, and micro-loans

Learning system challenges and opportunities

Players at all levels (policy, science, and local practice) have been slow to recognize that we need dramatic advancements in knowledge, information-sharing, and coordination to respond effectively to the increasing frequency and intensity of natural disasters (floods, droughts, etc.). Even to apply the knowledge and skills we have today will require unprecedented collaboration across a myriad of system boundaries: organizations, sectors, disciplines, constituencies, levels, and geographies.² This poses a daunting management challenge. Success will depend as much or more on building trust and understanding as on changes in formal policies, structures, and protocols.

A growing body of research argues that techno-science knowledge will not be effectively applied unless the societal learning system is robust. A recent study looked at a number of efforts to apply techno-science in a variety of local contexts, such as: helping farmers sustain aquifer-based water sources, preventing the depletion of fishing stocks, and mitigating the effects of destructive El Nino events (Cash et al., 2003). The authors found that there were several critical success factors for what they called an effective “knowledge system”: 1) *communication* (meetings, workshops, bulletins, etc.) among techno-scientists and “decision makers,” including: water managers, farmers, emergency management officials, and industry leaders; 2) *translation* that ensures that techno-scientists and decision-makers understand each other, overcoming hurdles of jargon, language, and mutual stereotypes; and 3) *mediation* that brings “all perspectives to the table” to work out agreements for collaborative action (2003: 8088). They emphasized the importance of managing “the interface between communities of experts and communities of decision makers” (2003: 8086). The study concluded that “designing knowledge systems for sustainability” means learning “how to harness the boundary-spanning potential of multiple individuals and organizations” to increase the validity, usefulness, and legitimacy of techno-science so it gets applied by local practitioners (2003: 8090).

These research findings correspond with those observed in the W&C cases: Leveraging knowledge to get results depends on a robust community-based learning system. An important implication of this perspective is that governments, NGOs, funders, and multinationals must reframe public good challenges. The learning system model argues that we should pay as much attention to the learning capacity of a region as we do to the nature of its presenting problems—whether poverty, human rights, or drought. Knowing the answers is not enough. We must also build the learning capacity of the social system to affirm, adapt, and apply solutions to get results.³

² A news report of the devastation wreaked by the recent tsunami in Southeast Asia highlighted the importance of system-wide coordination to leverage knowledge: “For the scientists in Hawaii, at the planet’s main tsunami center...there was intense frustration. They had useful information; they were trained to get word out; but they were stymied by limitations, including a lack of telephone numbers for counterparts in other countries” (Revkin, 2004).

³ A salient global example: Leading scientists worldwide have validated the existence of global warming. Yet U.S. Government leaders do not recognize this finding and its officials do not formally participate in ongoing negotiations related to the Kyoto Treaty.

Community Denouement

The W&C Community support team spent two months working with the regional stewards to develop cases as a baseline for identifying insights, questions, and methodologies to share across regions. Progress was slow and often went dormant. The Central America case was the most complete. The Bangladesh effort petered out after an initial rough draft—until a visit from the CPWC sponsor helped spur a much-improved second version. The West Africa initiative, after a series of false starts, finally shut down. (West Africa, it turned out, did not represent a system with a sufficient array of stakeholders. The activity there consisted of a nascent community of techno-scientists who were trying to connect across national boundaries.)

For both technical and motivational reasons, we were only once able to get key players from all three regions on the phone together—for an initial introductory call. After that, we could not convene the group, even to talk about what it would take to convene the group! By the time the Bangladesh case had been finished, months after our original due date, the Central American steward had taken another job. Hence we never met as a group to talk about cross-regional insights and issues.

Fundamentally, the problem was that key stakeholders at global and local levels were not sufficiently engaged—either in terms of participants’ time or sponsor financial commitments. Communities of practice only work when members are passionate about a common set of issues and feel a strong internal motivation to connect with peers. In addition, the community faced a sustainability issue. Strategic communities require funding for coordination and support. While the W&C Community sponsors were willing to provide start-up funding, their expectation was that regions would find local sources to continue their activities—but this did not happen.

As participation waned, the sponsors, support team, and community members talked and they agreed that there was not sufficient momentum to continue. The CPWC sponsor encouraged support team members to present key frameworks and findings from the case in an international forum. This would be an opportunity to present useful project outputs, including the learning system framework and associated success factors and pitfalls, as well as two illustrative case studies. Meanwhile, the report will inform CPWC’s Capacity Development Partnership initiative. The support team could also contribute to an effort under consideration in Central America to build a “regional platform” whose purpose is to disseminate knowledge about W&C management strategies. Practicing what we preach about collaboration would mean engaging policy makers, techno-scientists, funders, global institutions, and local actors in the development of the scope and structure of such a program.

Lessons Learned

Lessons learned can be organized into three categories: 1) strategic focus; 2) structural context; and 3) development issues. *Strategic focus* addresses the scope and scale of the initiative; the *structural context* includes member selection, key roles, and the technology infrastructure; *development issues* refer to milestones and typical tensions that arise during a community’s evolution. These lessons summarize and elaborate on many of the success factors and pitfalls mentioned earlier.

Strategic focus

The strategic focus for the W&C Community missed its target on two counts: The initial scope of the domain was not defined well enough, and the global scale was too much too soon.

1. Scope

Without a clear scope that engages participants, a community is unlikely to succeed. The focus of a community determines the types of members who will participate and how they will interact. On the one hand, if the emphasis were on *specific water-and-climate methodologies*, then a community's focus would be on particular coping strategies, such as early warning systems or drought-management approaches. In that case, the key players in the community would include techno-scientists, local water specialists, farmers and others who apply the knowledge in their various work contexts. The initiative would be most likely to succeed when the land and water conditions in members' regions were comparable and the methodologies were generalizable across sites.

On the other hand, if the emphasis were on *cultivating learning systems*, then the community's focus would be on social structures that promote a region's ability to build, share, and apply knowledge. In the W&C pilot, a key challenge for members was defining the notion of a "learning system" (as outlined in Figure 6)—a topic that is fuzzier than technical solutions and which differs from multi-stakeholder partnerships. (Of course, all three are interrelated.) A vital community *about* learning systems would require active participation by policy makers, techno-scientists, town officials, and others. In the end, the W&C Community decided to focus on ways to cultivate regional learning systems; but because this objective was not made clear at the start—during the discovery process—the community did not have with the right mix of players to build expertise in this area.

2. Scale

In retrospect, it seems that the global scale for the W&C Community initiative, given its context, was too ambitious. Instead, we could have established a successful foundation for future growth by focusing first on one region, such as Central America. Starting at the regional level would have reduced the culture, language, and time zone differences and limited the disparity of ecological conditions and mitigation methodologies to compare. These differences undermined members' ability and desire to collaborate. Moreover, a regional initiative could have focused project resources and sponsors' influence on learning system breakthroughs that were likely to achieve relatively quick and visible results—for example, increasing collaboration among scientists, technicians, and local water managers to spread the use of effective early warning systems.⁴ Without strong anchors within regions, it is unlikely that a region-to-region network will succeed. Passionate members are harder to find, they have less to contribute to each other, and both members and sponsors lack enough internal motivation to participate. While the global scope has tremendous potential, when members' interests are diffuse and they have only a weak sense of collective identity, it may be better to go global by starting local.

Structural context

Community structures include participant roles (including the sponsor, support team, coordinators, and members) and enabling technologies. Member selection influences participation, which is a bottom-line measure of community vitality. The sponsor, support team, and coordinators must be especially effective if a community is going to gain strategic influence and broad visibility. Finally, given a global scale, enabling technologies are essential.

⁴"Relatively quick" initial results could be 2-3 years, with visible progress in the first year. As for the broader learning system, Cash et al. state that "the time scales involved in enhancing human and institutional capital" are likely "a decade or more" (2003: 8090).

3. Member selection

The W&C case highlights the importance of convening members whose interests and capabilities match the strategic objectives of the sponsor. Fundamentally, community participation is voluntary and therefore self-selected. When a sponsor offers to fund a community on a specific topic, it may invite practitioners who want to participate and then fund activities for a selected core group. But if external criteria are used, it is particularly important to ensure that they will attract a group of members who share compelling issues and want to learn and work together.

Unfortunately, two of the sponsor's selection criteria did not align well with its goal to cultivate a vital community of practice: 1) multi-dimensional diversity, and 2) a good source of case material. These criteria are excellent ones for selecting participants in a research study or for a project team; but they are not so good for choosing core-group members of a community of practice. (Other criteria worked well, such as leadership in the field.) The first criterion, multi-dimensional diversity, refers here to the differences among members on a wide variety of dimensions: topics, objectives, target audiences, geography, and maturity of the local initiative. Diversity itself is generative in communities, but too much (or too little) can hinder their development. The extreme diversity of the W&C Community made it difficult for members to find common ground. Their local topics, for example, ranged from transnational research on Integrated Water Resource Management to the implementation of early warning systems in small villages. Furthermore, language differences exacerbated the virtual communication challenges (and vice versa); local roles and projects varied a great deal, and some were still getting established while others were well on their way.

The second criterion, a good source of case material, conformed to an ongoing CPWC objective to capture knowledge about regional W&C initiatives worldwide, but here it turned out to be problematic. While communities may initiate case-study research, such work is very time-consuming and requires high levels of internal motivation by members. In this case, members did not fully understand what they were signing up for, and as it turns out, did not have sufficiently self-serving reasons to write and discuss case studies about their work.

4. Sponsorship, coordination, and support

Sponsorship. It was unclear how much authority sponsors should exert in order to motivate participants to complete their case studies. The CPWC sponsor wanted the community to produce regional cases (in part, to contribute to its broader knowledge-dissemination program), but as we discovered, this goal was not compelling to most members. At one point—in response to a request from the support team—the sponsor used its influence to spur a regional team to redraft a case. But applying external pressure to influence member participation can be counterproductive. It can undermine members' sense of agency and lead them to disengage even further. Although we do not know that this happened here, the sponsor's emphasis on completing the case studies, (reinforced by the support staff), was more consistent with managing a project team than sponsoring a community. Typically, teams are managed according to externally-driven objectives, job requirements, and hierarchical reporting relationships; in contrast, community participation is essentially voluntary and members negotiate with sponsors to set objectives that align with members' self interests (Wenger and Snyder, 2000). Finally, the tension between sponsor expectations and members' motivations was exacerbated because the Metanoia sponsor was not sufficiently informed by the support team about the community's progress. All of these shortcomings might have been addressed if a clearer community charter had been established at the start.

Coordination. There was far too much uncertainty about the roles of the regional coordinators—also known as “local stewards.” In fact, these disparate terms reflected the ambiguity of their roles. Were they expected to coordinate a local community, or steward a particular project (such as a case study)? This ambiguity was especially problematic because the stewards varied widely on several dimensions: levels of participation, relevant expertise, and local influence. Moreover, several of the key frameworks and activities were relatively unfamiliar to them, and this project was an adjunct to their primary jobs. Finally, the global support team and local stewards did not start out with a shared language about what they were doing and why. This contributed to persistent problems keeping commitments to deliverables and deadlines.

Support team. The W&C support team was responsible for coaching coordinators and sponsors, and it served as a liaison between them. Ultimately, much of the confusion about the community’s strategic focus as well as the ambiguity about the roles of sponsors and coordinators can be attributed to insufficient guidance from the support team. Team members—including two in the U.S. and one in the Netherlands—had never met together in person to talk about their roles and to align their collective understanding of how to work with sponsors and local stewards. Ideally, the initiative would have started with a face-to-face meeting that would include all three members of the support team and both the CPWC and Metanoia sponsors. Its purpose would have been to come to a shared understanding of the scope and scale of the initiative, lay out expected activities, define key roles, and agree to a plan for identifying participants and cultivating the community’s development.

5. Collaboration technologies

The technology-related problems were significant—and they were as much social as technical. A very basic problem was getting a robust teleconference line to link all participants, from North and Central Americas, Europe, West Africa, and Bangladesh. Callers were constantly getting dropped, could not hear over the static, and many were paying exorbitant rates. Computer access to the website was also problematic. Ironically, this was especially true for people in the high-tech CPWC headquarters in the Netherlands, where the firewall was so effective that it obstructed their participation.

The thorniest social issue was getting people to participate virtually—whether via teleconferences, email, or the online knowledge base. Language was a problem, particularly for those who could not speak English (or, to reverse the perspective: Spanish, French, and Dutch!) fluently. At its root, the motivation problem had more to do with the mix of members and domain ambiguity than it did with particular technology hurdles. Finally, even with stronger participant commitments, it was clear that coordinating online collaboration activities—whatever the technology—would require considerable support by a skilled community coordinator or support team member.

Community development

In each development stage there are particular tensions that the community needs to address—finding its focus (discovery), coming together as a group (coalescing), and taking on substantive projects and broader membership (maturing). (See Figure 7.) The W&C Community’s difficulties during each of these stages provide instructive lessons learned about the development challenge. Finally, its legacy is important to consider, however the community ends up.

6. Discovery

The community did not effectively define its focus (aka its “learning agenda”) during the discovery phase. Defining a learning agenda is a socially and cognitively complex process. It generally requires a series of personal conversations with potential core members of the community as well as with key stakeholders—including possible sponsors. The discovery process is especially important for strategic community efforts that depend on strong sponsorship. There needs to be a clear benefit for the investments of time and money by both members and sponsors. In this initiative, though the CPWC sponsor wanted to support case-study work, this activity did not captivate the attention of participants.

7. Coalescing

Interpersonal relationships and a collective sense of belonging are critical success factors throughout a community’s lifecycle. These qualities are particularly salient during the coalescing phase because they are its development objective. Although there was much goodwill among participants, the group did not coalesce on an interpersonal level; nor did members feel a shared commitment to a joint enterprise. The lack of sufficient face-to-face experience undermined the community’s development. Even with stronger shared knowledge goals, it was unrealistic to galvanize a community of such disparate members without occasions to get to know each other better.

Community development issues

Stage	Theme	Domain	Community	Practice
1. Potential	<i>Discovering common ground</i>	Seeing your real passion as a worthy domain	Finding enough potential members to imagine a community	Understanding what knowledge is valuable to share or develop
2. Coalescing	<i>Finding value</i>	Establishing the value of the domain	Developing relationship, trust, and rhythm	Helping each other, sharing tips, solving problems
3. Maturing	<i>Building communal identity</i>	Placing the domain in context	Expanding the membership	Establishing standard practice and setting a learning agenda
4. Stewardship	<i>Taking responsibility</i>	Achieving influence and ongoing relevance	Balancing intimacy and openness	Remaining world-class
5. Legacy	<i>Leaving something behind</i>	Understanding new circumstances	Closing gracefully and seeing new trajectories	Recasting the practice into a legacy

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Figure 7 – Community development issues at each stage.

8. Maturing

The community never matured sufficiently to take on what became its central challenge—writing and discussing case studies. Participants and sponsors believed that cases would help members identify common problems and share lessons learned. Indeed, the casework highlighted several promising opportunities to address—had the participants stuck around to explore them together.

In retrospect, however, perhaps we expected too much from the group before it had a chance to coalesce. If we had organized teleconferences simply to share experiences about how to engage policy makers or how to facilitate communication between techno-scientists and villagers—perhaps members would have been plenty motivated to participate. Making the case studies a prerequisite for working together created an unnecessary hurdle. A series of teleconferences could have been organized for members to simply share problems and ideas. Successful teleconferences, in fact, might have helped us achieve several goals at once: disseminate good ideas, build relationships, and generate material that could be used to inform case-study work down the line—when the community was ready for it.

It is important not to push a community's development before its time. Otherwise you risk killing the goose that lays the golden eggs: the internal motivation of members to learn and work together to build capacity in their field. Communities of practice—particularly sponsored ones—often face this tension between meeting external expectations and following their natural course of development, however gradual or meandering it may be.

9. Legacy

The group had significant difficulties during the discovery and coalescing phases, and it never quite matured. Nevertheless, its legacy includes useful individual insights and new professional relationships. We hope this report and associated conversations will go even further by providing valuable guidance to global network leaders who seek to energize peer-to-peer learning within and across local initiatives.

Value Created and Potential

Perhaps the best way to document a community's value is through stories. For example, George de Gooijer reported that the learning system framework had been very useful for helping leaders of a separate water-and-climate initiative in Bosnia. Unfortunately, in the W&C Community initiative, several significant opportunities to create value within and across regions were left on the table. For illustration purposes, however, it is worth considering how the story might have played out. A story line describes the causal links between community activities, increased capacity, and W&C results. Figure 8 provides a value-story template and a hypothetical illustration. This story tells how the community's activities built member regions' capacities to connect techno-scientists and local practitioners to better manage W&C threats. It tells how regions shared knowledge about ways to convene diverse stakeholders to build understanding, relationships, and working agreements. Community members coached each other as they applied these methodologies in their respective regions. In the end, they achieved better results, faster, due to their collaboration.⁵ Meanwhile, the community documented its insights, methodologies, and directory of experts; and they diffused this knowledge to additional regions through their website, newsletters, and workshops; and most importantly, by growing the community itself.

⁵ See p. 25 in Appendix for examples of results and related methodological issues that are relevant for a WCV system.

A W&C Community Success Story—Illustrative			
Convening the Community	Identifying Common Issues	Building Local-Global Capacity	Getting Results
<ul style="list-style-type: none"> ▪ GAN-Net works with sponsors to identify opportunities for region-to-region learning and to recruit a core group of appropriate regional leaders ▪ W&C community grows to include diverse types of leaders from Central America, Bangladesh, and West Africa—including: techno-scientists, policy makers, funders, NGOs, and local water managers and officials 	<ul style="list-style-type: none"> ▪ In peer-to-peer teleconferences members share ideas and experiences about how these issues play out in participating regions. ▪ Case study descriptions of regional “learning systems” highlight several areas to explore, such as building local capacity and linking local practitioners and techno-scientists 	<ul style="list-style-type: none"> ▪ <i>Local:</i> Coordinators leverage new ideas, methods, and peer encouragement to facilitate conversations between regional practitioners and techno-scientists; these players gain a deeper shared understanding of problems and solutions ▪ <i>Global:</i> Community members across regions share their experiences and consult to each about glitches and practical tips for overcoming them ▪ Methods discussed and documented include: stakeholder dialogues, mediation processes, and “whole-system” learning conferences 	<ul style="list-style-type: none"> ▪ Techno-scientists and town officials working together; real-time storm updates are getting used in local villages ▪ Town emergency units have educated residents and learned to use early warning systems; they are using input from techno-scientists to further mitigate risks by improving farming methods and building codes ▪ Models indicate 50% reduction in exposure to human and financial costs of natural disasters ▪ New regions are participating, reducing global vulnerability

Figure 8 – Template for Constructing a Success Story.

Summary

The W&C Community initiative highlights major challenges for any strategic community: defining issues, building relationships, identifying practical opportunities to create near-term value, and establishing necessary structural conditions (including a sponsor board, support team, and collaboration technology). It identifies success factors to apply and pitfalls to avoid for achieving breakthrough results. Success factors included community coordination and support, upfront identification of priority issues and expectations, and educated buy-in from community members and sponsors. Pitfalls included member selection and insufficient face-to-face time to develop relationships. Finally, the community’s development was hindered by miscalculations during the discovery and coalescing stages, and perhaps because it was pushed to mature too quickly.

Nevertheless, there is much to learn from this community’s legacy. The case points to promising opportunities for regions to accelerate capacity-building by collaborating across regions and by applying a “learning systems” approach within them. And it highlights the types of skills and interventions required to cultivate a strategic community, especially when participants are both highly diverse and distantly located.

Stepping back from the lessons learned about cultivating communities of practice, the W&C Community story also points out an emerging transformation in the administration of global action networks (GANs).⁶ The implications of this transition are important to consider, because they address the role of global organizations that are most likely to sponsor, support, and coordinate communities such as the one described in this report.

Reflections on the role of the Network Center

The W&C Community initiative raises questions about the role of the Network Center as a coordinator of a peer-to-peer learning network. If knowledge-sharing among local partners is essential for achieving global results, then how can the Center best promote it? Historically, the Central Office has acted as a headquarters that serves as an institutional agent of the network—allocating funds, coordinating specific programs, and advocating global policies on behalf of its members. As learning and innovation have become more important, headquarters staff have also taken on a “center of excellence” role. But both the headquarters and center of excellence models put the Center in a hierarchical position vis-à-vis local networks—whether as a top-down, decision-making authority or as a privileged knowledge-distribution channel. Such roles differ from a horizontal, community coordinator relationship, as depicted in Figure 9.

Contrasting “Center of Excellence” and “Community Coordinator” models

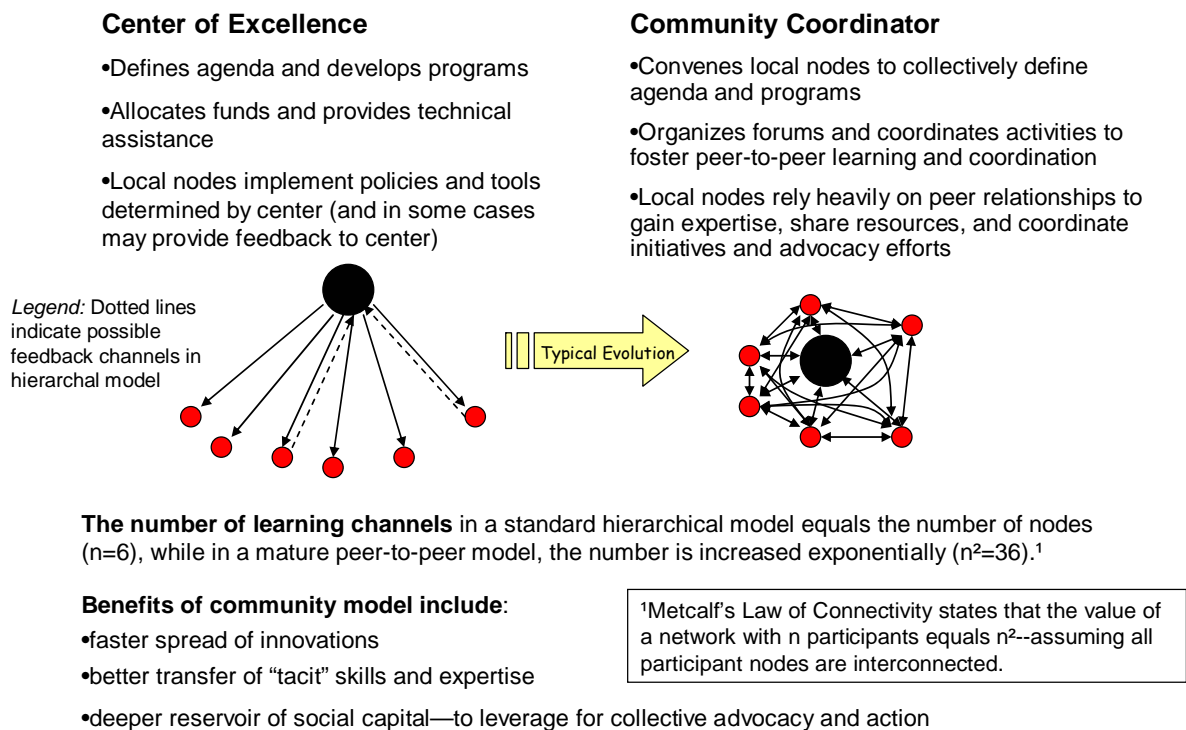


Figure 9 – Contrasting hierarchical vs. horizontal roles of the Network Center.

⁶ Global action networks can be defined by five characteristics: global scale, public good purpose, diverse stakeholders, network structure, and an action-learning approach for getting results. (This definition is adapted from the more established one introduced by Steve Waddell (2003) and recently elaborated in Waddell, 2005.)

The W&C case outlines the nature of the Community Coordinator role. It suggests that the most useful role of the Center may be to provide a combination of sponsorship, coordination, and support for a peer-to-peer global learning network. (Combined, CPWC and Metanoia provided all three of these functions in the pilot—either directly or contracted.) Of course, while it facilitates learning and innovation, the Center can continue to provide institutional agency on behalf of the network; both of these roles are useful and they serve complementary purposes. In fact, many Network Centers today operate as hybrids, combining headquarters, center of excellence, and network coordinator functions.⁷

The most effective role for the Center depends largely on the level of maturity and skills among local partners. How well do they meet the expectations of peers, stakeholders, and the board as competent and credible organizations? How ready are they to reach out to peers and coordinate projects and learning activities? As the community matures, the Center should expect that community players will want to play a stronger network governance role, taking on functions such as targeting knowledge priorities, structuring mechanisms for information dissemination (tools, conferences, online knowledge repository), and building local and global partner relationships.

* * *

Implications for action

A next step is to propose the development of a Water and Climate Learning System that can build on current plans to establish a W&C “regional platform” (as stakeholders in Central America call it). The project’s purpose would be to increase the region’s capacity for learning, coordination, and advocacy. Conceived as a learning system, a regional platform is much more than a center of excellence that captures knowledge and distributes it to local practitioners, (who, as experience shows, often distrust its source and usefulness). Rather, a learning system approach engages stakeholders throughout the system to collaborate on a mix of policy, scientific, and practitioner issues. Such an approach could be a model for regions around the world working on a variety of W&C strategies. For example, it could guide the development of a global learning system focused on the development and application of early warning systems at the basin level.⁸

Finally, the insights in the W&C case about communities of practice, learning systems, and the emerging role of the network center are highly relevant for a growing number of global action networks, whether their focus is forestry stewardship, corruption, labor rights or others. Many GANs are navigating new waters as they transition from the traditional headquarters and center of excellence roles to one that integrates the functions of a community coordinator. GAN-Net, as a community of global networks, can help GANs apply these strategies to improve results on an array of public good issues worldwide.

⁷ W.M. Snyder and X. de S. Briggs (2003) describe an analogous shift of the role of the U.S. Federal Government from controlling policy and implementation to coordinating multi-sector *governance* structures for learning and innovation.

⁸ The recent devastating earthquake and tsunami that affected coastal areas in several regions—including South and Southeast Asia as well as East Africa—tragically illustrate the scale of disasters that global climate changes could cause. These events show the importance of implementing WCV methodologies such as early warning systems, both within and across regions.

APPENDIX

Case study (Draft) of the Central American region—Honduras: Small Valley Program

This case (still a working draft) was written primarily by the local coordinator in the Central America region, Alejandra Aguilar, using the learning system template developed during the Water-and-Climate Variability project.

The case material is structured to provide a brief analysis of the three main community groups in the learning system model: policy makers, techno-social-scientists, and local practitioners. This summary identifies relevant players; and it also describes a bit of the historical context, key issues, and in some cases, successes achieved. The case concludes with a number of comments and recommendations written by the support team.

Policy Context

Players: The main institution of Honduras' Emergency Management System is the Permanent Contingency Commission (COOPECO), which provided training in prevention awareness; as well as connecting local committees in different regions of the country. Thus COPECO is the coordinator institution for natural disasters including floods.

COPECO has regional organizations, the Local Emergency Committees (CODEL) and the Local Government Emergency Committee (CODEM). Both structures are legally defined by Honduras Legislation (Contingency Law N. 9-90E, 1990). Despite the legal disposition of the local committees' creation, it is not common to find these kinds of structures at the local level because both lack of national support and local awareness.

History/Issues: The 2002-2006 Honduran National Government Plan, "Environmental Sustainability," mentioned as one of its goals the establishment of a national policy on risk management. It also mentioned the need to strengthen institutional coordination for risk management and the need to create a new law that establishes the Prevention and Mitigation of Emergencies and Disasters National System. But none of these dispositions have been accomplishment by Honduras government

There is political interest in water-and-climate (W&C) systems, but there are not enough economic or human-technical resources in the country to implement and manage them. Honduras has the most important and greatest number of implementation experiences of the Early Warning System (EWS) in the Central American region. Although the projects have been executed by local and international organizations, there is a lot of experience at the institutional level. COPECO had coordinated many experiences that have strengthened its own technical capacity. They have enough understanding about coordinating actions at social and political levels and also to review the technical aspects of an EWS implementation. But they don't have the capacity to implement because there are not enough resources to execute the approach. COPECO's annual budget is reduced, and they don't have the capacity to offer matching funds needed to obtain international cooperation⁹.

⁹ Institutional Report of Honduras presented in the regional Forum Mitch+5, December 2003. www.cepredenac.org

Techno-social-science context

Players: Major techno-science institutions are the Permanent Contingency Commission (COOPECO), which provided training in prevention awareness; as well as connecting local committees in the region; FUPAD, which engaged experts in many areas, such as hydrology, civil engineering, social science, medicine, disaster prevention, and forestry; ASFPM, which provides technical assistance for hydrological studies; the Red Cross and Honduras Fire Department, which collaborated on training in the Principles of Evacuation and Water Rescue; the Organization of American States (OAS) provided support, based on its experience with the Environmental and Sustainable Development Unit (in Masica and Arizona on the Honduran northern coast); the Associated States of Flood Prevention Management helped by transmitting technical information needed to install the EWS at the local level; AMHON (Honduras Municipal Association) and FUNDEMUN (Honduras Municipal Foundation), which provide support in the coordination and organization in the workshops and activities conducted to municipality training and awareness; Environmental and Natural Resources Secretariat (SERNA), which provides experts in natural disasters management to train communities; US Peace Corps, which provided a two year volunteers program just to support in the project activities—Peace Corps volunteers supported all kind of activities at technical and social level.

History/Issues: Capabilities for designing and implementing early warning systems were based on experience in Masica and Arizona on the northern coast of Honduras. The earlier 1997 project was funded by OAS and is now sponsored by GTZ. Leaders of the Small Valley Program (SVP) developed manuals with information on the different aspects (technical and social) related to creating an EWS. In Honduras, professionals in water and climate sciences are not accustomed to working at the local level with communities. The quality of interactions between socio-techno-science organizations and players at the local level is low.

Despite the enormous need of hydrological information and technical support that Honduras has, there is very little hydrological information available even for the most important river basins. In addition to the lack of technical information, probably Honduras' weakest area for the EWS development is the lack of hydrological engineers. There are not enough hydrological engineers with the capacity to develop a EWS at local level working with communities. Indeed, for the SVP, it was necessary to work with American engineers from the ASFPM (Associated States of Flood Prevention Management). They were the technical experts who developed the hydrological plans for each small river basin, and they also designed the technology for the system.

On the other hand, in the Honduras case, there were enough experts for addressing the social aspects of the EWS installation (profesionales en educación y sociólogos). It is much easier to find professionals who can work on the social aspects than to find hydrological engineers who can develop the hydrological plans. Fortunately, in the case of SVP the coordinator was a civil engineer who had the openness to balance the social and technical aspects of the EWS.

In spite of the scarcity of professionals in sciences trained to work at the local level, the SVP succeeded in combining scientific, economic, and social and cultural dimensions in order to implement EWS.

The OAS technical support was critical to maintain the balance between technical, social, and political aspects. Through this support, the coordinators understood that working with the mayors of the municipalities or with the training communities was as important as the hydrological plans.

Local practitioner context

Players: The key organizations at the local level were ones that are legally defined by Honduras legislation. These are the Local Emergency Committees (CODEL) and the Local Government Emergency Committee (CODEM). Both structures are local chapters of Honduras' Emergency Agency (COPECO).

Key criteria for selecting sites in the program were: 1) a high level of organization at the local level; 2) community commitment to implement the EWS system—including commitment to collect data locally and send them promptly to the Local Center in each local government; and 3) local government commitment to support an office for a Local Emergency Center, including the salary of a full-time employee to manage the local center.

History/Issues: The EWS developed by SVP has been criticized by a sector of Central American hydrological professionals who stated that the “rustic system” for early warnings in river basins is inadequate to achieve the standards of risk-management systems that should be developed in the region. However they did not seem to take in to account the cost- efficiency of these systems and the advantages they offer compared to more complex and expensive systems that would be very difficult to establish, manage, and finance at local level

SVP had as one of their main achievements the implementation of local centers in each municipality in which they were working. Four local centers were created and each one has an employee trained by the SVP experts. These centers provided a data base for the hydrological technical information that was developed, and it captured and incorporated new information provided by the local committees. The local center managers were not experts but they were carefully trained in the area of information management.

A project coordination committee facilitated peer-to-peer learning and coordination among practitioners across municipalities to support the EWS implementation, maintenance, and application. For example, peer-to-peer exchanges among local actors of the La Masica and Aguan organizations were part of the training process. Also, local leaders who were part of the facilitation team worked with other communities as a way to share their experiences, insights, and methods with other local groups. (Unfortunately, it is not possible to make comparisons across the sites because there is not enough information now available on capabilities at the municipal level. This would require additional on-site data gathering.)

Originally, the project was not designed to be a network of municipalities coordinating EWS information in a peer-to-peer network (community-of-practice model). Rather, each local system was to be connected directly with COPECO (center-of-excellence model). Thus, it's notable that a final recommendation of the local actors in the SVP was to create an inter-municipality coordination group that would include a technical assistance capability. This group would focus on issues directly related to water-and-climate variability, rather than on development defined more broadly. This recommendation was not implemented.

Sections below written by the support team:

Results can be measured in terms such as the following:

- Fatalities
- Loss of land and livelihood
- Lost labor income
- Lost crop income
- Cost of repairs to fields, homes, etc.
- Loss of home and other assets
- People uprooted from villages and migrating to cities
- Deforestation

Key issues related to results include:

- How to measure results at local and national levels
- How to ensure validity of results—and use these to inform direction of science, policy, and learning activities at all three levels
- How to compare results across localities
- How to use results to promote collaboration across local municipalities for learning, resource-sharing, and coordination
- Willingness to make results public (local and national)

Overall case comments and recommendations

1. There are several examples of misalignment between socio-techno-science and local levels—for example the critique of the “rustic” early warning systems implemented in the SVP.
2. The key structural element in the SVP case is the requirement that each municipality commit to staff a “Local Emergency Center.” We should explore more what these did and how well, and what kind of model this suggests for any learning system that wants to establish strong local roots.
3. The SVP was not originally designed to be a peer-to-peer network. It is not clear how much support there is at policy and techno-science levels for peer-to-peer networks among local sites that promote learning, coordination, and advocacy.
4. Increased capability to manage climate variability will require unprecedented coordination across organizations, horizontally and vertically. This poses a daunting management challenge. Success will depend as much or more on building trust and shared understanding as on formal changes in management authority and policy.
5. Many of the issues identified here seem to be highly transferable to other regions (and this was confirmed by the analysis in the Bangladesh report). Generalizable issues include:
 - a. Developing ways to foster collaboration of key players throughout the learning system, both horizontally and vertically
 - b. Developing local-level institutional capability for learning and innovation, as the foundation of a region’s capacity to prevent, prepare, and respond to climate-related disasters

- c. Collecting and disseminating information horizontally and vertically—e.g., from scientists to policy makers as well as to villagers—so it can be understood and applied effectively
- d. Building stronger relationships and increasing coordination among NGOs (as well as government agencies and private-sector organizations) who can provide support for prevention, preparation, and response
- e. Cross-regional sharing of specific policies, scientific findings, engineering methods, and local skills that can be applied to types of climates that exist in various regions worldwide. There were several examples of successful mitigation methods used in Bangladesh that may apply in Honduras or other regions (with local adaptations); these included: reinforcing residence structures, food storage, and micro-loans.
- f. Identifying categories of results and finding ways to measure and report them.

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